

### REMARKS

The applicants thank the Examiner for his careful attention to this matter. Claims 1-32 are pending in the application, and claims 1-24 and 26-32 have been rejected. Claim 25 has been objected to but is found to be patentable if rewritten into independent form.

#### Rejections Under 35 U.S.C. §112

The Examiner has rejected claim 8 under 35 U.S.C. § 112, second paragraph, as failing to set forth the subject matter which applicants regard as their invention. Claim 8 is an original claim that has never been amended. Claim 8 recites “[t]he method of claim 7, wherein the nul step instigates regeneration.” The written description as filed provides literal and complete support for this claim. In particular, the written description states: “A nul step does not perform a function when it is executed; instead, it serves as a placeholder that may initiate a regeneration cycle or perform some other action.” (Application, page 9, line 30-32.) Thus, the nul step of the present invention is *not* simply a “wait” cycle as suggested by the Office Action. Rather, the nul step is broader, and is more than a simple wait. Specifically, the nul step does not perform a function, but it may have a variety of resulting actions, including the instigation of regeneration. Therefore, claim 8 definitely sets forth what the applicants regard as their invention, as shown by the inclusion of the language of claim 8 in the written description of the original application.

The Examiner has rejected claim 23 under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which the applicants regard as their invention. Claim 23 recites a nul step whose execution does not affect the model. The Office Action suggests that such recitation is contradictory to claim 8. It is not, however. These two claims simply recite two possible and distinct types of nul steps – one that instigates regeneration, and one whose execution does not affect the model. By analogy, an applicant is certainly able to recite a dependent claim that states “...wherein the widget is round,” and a separate dependent claim that recites “...wherein the widget is square.” This is precisely what dependent claims are for, and cannot be said to create an inconsistency. Likewise, claim 23

creates no inconsistency with the entirely separate claim 8.

Rejections under 35 U.S.C. § 103 over Hatanaka

The Examiner rejected claims 1-3, 6-14, 16-21, 23, 24, 26 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka (U.S. Patent No. 5,923,573). Claims 1, 14, and 18 are the independent claims of this group. Claims 1 and 14 have been cancelled without prejudice, making their rejections moot. The claims that depended on claims 1 and 14 have all been redrafted to be dependent on claims 4 and 15, which have been separately rejected. The rejection of the dependent claims (claims 2-3, 6-13, and 16-17) is addressed more completely in the next section when addressing claims 4 and 15. Claim 18 is the only remaining independent claim of the group above, and has been rewritten to incorporate the limitation of claim 22 (which has been cancelled).

With respect to the Office Action's substantive obviousness rejections, all suffer from the same defect: they announce that a particular feature is obvious, without identifying any motivation to change or combine the prior art so as to produce the claimed inventions. Moreover, the Office Action fails to appreciate that the authors of the prior art references themselves failed to generate the supposedly obvious solutions. Also, none of the rejections cites any evidence to support the conclusion of obviousness. Such analysis is insufficient as a matter of law, and suggests an improper hindsight view of the prior art using the pending application as a template. *See In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002) (noting that Board (and examiners, by extension) must provide explicit factual support for its conclusions supporting rejections); *In re Kotzab*, 217 F.3d 1365, 55 USPQ2d 1313 (Fed. Cir. 2000) (faulting the Examiner and Board for falling into the "hindsight trap."); *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (same).

On the merits of the rejection of claim 18, that claim recites a method involving the generation of a first step and a second step to carry out changes made to an element. The second step is based on a predefined relationship between the first element and one or more other

elements, or on changes in a predefined relationship between the first element and one or more other elements. The Office Action does not indicate that the "generation relationship data" of Hatanaka meets these requirements, or even suggests them.

The Office Action indicates that Hatanaka has relationship information, but does not indicate what Hatanaka does with the information. The portion of Hatanaka cited by the Office Action, columns 7-8, simply indicates that "generation relationship data" includes elements "required for generating a graphic element, pointers for indicating parameters, and names of functions ... which provide a generating method." This passage does not indicate that the data relates to relationships between an element and another element or elements, however, as recited in pending claim 18. Nothing in Hatanaka discloses nor fairly suggests the particular use of relationship information as recited in claim 18. The mere fact that the system of Hatanaka causes other elements to be changed when one element is changed does not mean that Hatanaka accomplishes the change in the manner recited in claim 18, and the Office Action does not identify any motivation to modify Hatanaka in such a way.

The Office Action recognizes that Hatanaka fails to disclose the "second step" recitation of pending claim 18. (Office Action at 4.) However, the Office Action opines that such a step would have been obvious "in order to provide for other related elements to be modified which are based on the modification from the first created step and because since the same basic functions as claimed is shown in Hatanaka, it is substantially a matter of designating this as a separate step." It is not enough, however, for Hatanaka to make obvious a mere second step, because claim 18 recites the manner in which the second step is created: it is "based on a predefined relationship between the first element and one or more other elements, or on changes in a predefined relationship between the first element and one or more other elements." The Office Action does not indicate that this quoted requirement of pending claim 18 is either disclosed in, or fairly suggested by, Hatanaka. (The Office Action also provides no evidentiary support for the conclusion that these portions of pending claim 18 would be inherent in Hatanaka.) Furthermore, the first step and the second step in pending claim 18 are created before they are executed, whether they are created "together" or not, and the Office Action does not

indicate that such creation and execution is either disclosed or fairly suggested in Hatanaka. Rather, it is possible that creation and execution are alternating processes in the Hatanaka reference. For these reasons also, the Applicants respectfully request immediate allowance of claim 18.

There are also multiple bases, apart from the patentability of claim 18, for the allowability of the dependent claims. For example, claim 20 recites a second step that is one of a plurality of steps that can effect changes to the same element, where the second step is selected from the plurality of steps based on the generation of other steps. The Office Action appears to assert that Hatanaka suggests a second step, although it does not disclose such a second step. (*See* Office Action, at 12.) However, even if Hatanaka suggested a second step, the Office Action does not indicate that the second step of Hatanaka is selected from the plurality of steps based on the generation of other steps. This feature of claim 20 provides extra flexibility in the regeneration of models that simply is not present in the prior art. The Office Action also appears to suggest that selection of a second step from a plurality of steps based on a first step is common in graphics programs (such as by the repeated application of filters), and that claim 20 therefore would have been obvious. However, again, the Office Action offers no support for its assertion, and also does not indicate how a graphics program, which presumably operates on bit-mapped type images, would render obvious an invention using distinct drawing elements. Also, the graphics programs mentioned by the Office Action would involve generation and then execution of a first step, followed by generation then execution of a second step, while the claim calls for generation of both steps and then execution of both steps, because the claim is directed at a multi-element model rather than a simple bit-mapped image. Finally, nothing in the Office Action suggests that any prior art would select a particular second step based on what the first step was. Rather, in the Office Action's example of a generic graphics program, one filter operation would be independent of the previous filter operation, since any sort of operation could be selected between the two filter operations. The prior art simply does not tie the steps together in the manner recited in claim 20. Thus, claim 20 is very different from any art cited by the Office Action, and Applicants respectfully request its prompt allowance.

As another example, Claim 21 depends on claim 20 and recites that the second step is selected from the plurality of steps based on the generation of other steps. Again, Hatanaka does not disclose or suggest a second step or its use as recited in claim 21. Moreover, the Office Action's statement that use of a step in the manner recited in claim 21 is a standard function in a CAD system, is wholly conclusory and without any evidentiary support, as is required to make a *prima facie* case of obviousness.

As yet another example, Claim 23 recites a nul step. The Office Action admits that Hatanaka does not disclose this feature. (*See* Office Action at 13.) The Office Action asserts that use of a "nul" step to idle regeneration is well known, but the Office Action cites absolutely no evidence for that wholly conclusory proposition. In addition, even if one assumed that a prior art reference somewhere showed use of a nul step with regeneration, the Office Action establishes absolutely no suggestion in Hatanaka or anywhere else to use such a feature, or to use it as a step in a process for propagating changes through a model. Moreover, there could be many other ways to idle regeneration other than a nul step, and the Office Action does not show why a nul step would be obvious to us to idle regeneration, when such a nul step could be used for many other functions, as described in the pending patent application.

As another example, claim 24 recites locked steps which are not executed or whose execution is limited. Hatanaka merely provides a flag to indicate that certain relationship data is locked; it does not disclose or even suggest the use of a locked *step*. This rejection conflates the data for the model with the steps that are executed to modify the model. Hatanaka's flag relates to an F Node, "a center of the generation relationship" in Hatanaka's terms (column 8, lines 14-15), and it is that node in Hatanaka, not any step or steps, which can have a lock flag. The applicants thus request timely allowance of claim 24 also.

Likewise, claim 27 adds to claim 18 the requirement that all the steps on one element are executed before any steps on the next element. Again, the Office Action simply asserts without any citation to evidence that it would have been obvious to provide this additional feature. Also, the Action does not cite a single motivation for the skilled artisan to modify Hatanaka so as to produce the claimed invention. Rather, Hatanaka is silent on the subject, and as explained

further in this response, does not adequately disclose or suggest multiple steps relating to any particular element in any event. Again, because the Office Action does not show that the prior art discloses or even fairly suggests the claimed invention, the Applicants respectfully request allowance of claim 27.

In all, the Applicants respectfully request immediate allowance of claim 18 and all claims that depend from it.

Rejections under 35 U.S.C. § 103 over Hatanaka in view of Ardoin et al.

The Examiner rejected claims 4, 5, 15, 22, 28, 30 and 32 under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka (U.S. Patent No. 5,923,573) in view of Ardoin et al. (U.S. Patent No. 5,692,184). Claims 4, 15, 30, and 32 are the independent claims of this group.

In general, all of the claims but claim 32 require sorting of steps that are executed to reflect changes in a model. Amended claim 4 recites "sorting at least some of the steps before executing the steps," while claim 5 adds to claim 4 the feature wherein the "sorting is conducted using a depth-first search sorting method." Claim 15 recites "a step sorter that sorts the first step and the second step according to dependencies between steps." Claim 22 adds to claim 18 the feature of "sorting the first step and the plurality of steps to ensure that each step is executed after steps on which it depends are executed," while claim 28 adds to claim 18 the feature wherein "the first plurality of steps depends on the execution of the first step." Claim 30 recites "sorting the one or more steps and the one or more additional steps to eliminate interference among the steps."

The Office Action is incorrect that Ardoin discloses or even fairly suggests the sorting of steps for effecting changes to a model. Ardoin discusses the ordering of "nodes" and nothing more. Nodes are simply items in Ardoin that "can represent a value, an associative evaluation function or a predicate." (Ardoin, column 6, lines 34-37.) A "node" appears to be nothing like a step of the instant invention, and actually appears to be more like an "element" than a "step". Specifically, Ardoin notes that "nodes represent the related entities ..." (Ardoin, column 6, lines 31-33.) Therefore, even if Ardoin's nodes were the same as the steps in the pending claims

(which they are not), Ardoin at most shows ordering of nodes as part of an evaluation process, but does not show the feature of executing steps to change a model, as required by the pending claims. Also, even if Ardoin showed the same sorting feature as recited in the pending claims, the Office Action does not point to any motivation to alter Hatanaka using Ardoin. In addition, Ardoin indicates that the nodes are ordered so that they can be re-evaluated, thus indicating that they were *not* sorted when an initial execution was performed. Thus, for these reasons, even if one assumed that Hatanaka disclosed all of the other elements of the claims, Ardoin does not disclose or suggest the sorting of steps.

There are additional reasons that each of the independent claims recite patentable inventions. For example, independent claim 4, as rewritten, recites a method of propagating changes made to a design model. The method comprises identifying a change to a first element, creating a first step based on the element's structure or a relationship between the element and another element or elements, creating a second step based on the first step and one of the elements' structure or a relationship between two of the elements, and executing the steps. (The other independent claims recite similar features.)

As applicants stressed in their prior response with respect to then-pending claim 1, claim 4 recites that the first step is created based on the structure of the first element or on a relationship between the first element and another element or elements. The Office Action suggests that Hatanaka discloses creating a first step by "the supplying or creation of a generating method, disclosed by Hatanaka, as the generation method is defined based upon the relationship data." This statement in the Office Action does not make clear whether the referenced "relationship data" is that claimed in pending claim 4, or that disclosed in Hatanaka. Of course, if the statement refers to pending claim 4, then the Office Action is using improper hindsight to strike the claim. If the statement refers to Hatanaka, then the statement is incorrect. Specifically, the first "step" in Hatanaka involves displaying a kit model, not regenerating a model. Even the first alteration that occurs to the model in Hatanaka, if that is considered the first "step," is *not* based on an element's structure or a relationship between the element and another element or elements. Rather, the first step is simply based on an action (such as a

“move” selection) made by a user. There is nothing in Hatanaka or the present Office Action to indicate that Hatanaka bases the first step on an element's structure. And there is also nothing in Hatanaka or the present action to indicate that Hatanaka bases the first step on a relationship between the element and another element or elements.

At most, Hatanaka discusses “modification information” with respect to its first step, but such modification information is not alone relationship information. The modification information simply appears to track changes to a particular entity, but involves nothing regarding relationships of elements. In particular, Hatanaka notes that the modification information is “information for moving or changing an object line which is selected from curved lines of a kit model.” (Column 2, lines 61-63.) Nothing in this statement or any other part of Hatanaka that the Applicants can locate suggests that the modification data is the same as or even equivalent to relationship information.

The Office Action also suggests that Hatanaka's use of related elements somehow discloses or suggests the use of relationship information for the first step. However, as just indicated, even if Hatanaka uses some form of relationship information for a subsequent step, the Office Action has not shown that Hatanaka uses relationship information for a first step. Rather, in Hatanaka, the first step appears to be driven entirely and solely by a change to a first element, with no concern for relationship information.

Moreover, the Office Action indicates that Hatanaka has relationship information, but does not indicate what Hatanaka does with the information. The portion of Hatanaka cited by the Office Action, columns 7-8, simply indicate that “generation relationship data” includes elements “required for generating a graphic element, pointers for indicating parameters, and names of functions . . . which provide a generating method.” This passage does not indicate that the data relates to relationships between an element and another element or elements, however, as recited in pending claim 4. Nothing in Hatanaka discloses nor fairly suggests the particular use of relationship information as recited in claim 4. The mere fact that the system of Hatanaka causes other elements to be changed when one element is changed does not mean that Hatanaka



accomplishes the change in the manner recited in claim 4, and the Office Action does not identify any motivation to modify Hatanaka in such a way.

The Office Action recognizes that Hatanaka fails to disclose the "second step" recitation of pending rewritten claim 4. (Office action at 4.) However, the Office Action opines that such a step would have been obvious "in order to provide for other related elements to be modified which are based on the modification from the first created step and because since the same basic functions as claimed is shown in Hatanaka, it is substantially a matter of designating this as a separate step." It is not enough, however, for Hatanaka to make obvious a mere second step, because claim 4 additionally recites the manner in which second step is created: it is "based on the first step and the structure of one of the elements or on a relationship between two of the elements." The Office Action does not indicate that this quoted requirement of pending claim 4 is either disclosed in, or fairly suggested by, Hatanaka. (The Office Action also provides no evidentiary support for the conclusion that these portions of pending claim 4 would be inherent in Hatanaka.) Furthermore, both steps are created before they are executed, whether they are created "together" or not, and the Office Action does not indicate that such creation and execution is either disclosed or fairly suggested in Hatanaka. For these reasons also, the Applicants respectfully request immediate allowance of claims 4, 15, 30, and 32.

The dependent claims are allowable for additional reasons. For example, dependent claim 5 recites that the sorting of claim 4 is conducted using a depth-first search sorting method, and the Office Action simply asserts that Ardoin discloses something that is "equivalent in functionality" to the claimed depth-first searching. Even if that were true, "equivalent in functionality" is not the test for obviousness. Rather, the test is whether the claimed invention as a whole would have been obvious to an artisan of ordinary skill. To meet such a requirement, the Office must generally show that the prior art references disclose or suggests all that is recited in the claim, and that there is a motivation to combine or modify the references in the manner claimed. The applicants submit that the Office Action has not made such a showing, and that there is, therefore, no *prima facie* showing of obviousness, and that the claims are in condition for allowance.

Claim 6 recites that the steps are stored in a step repository, which, according to the pending application, is a particular area where steps are stored. To meet this feature, the Office Action merely indicates that the generation method of Hatanaka must be stored in some sort of memory, and it would have been obvious “to store the steps in a sort of memory or repository in order to repeat execution of the steps at a later time.” (Office Action at 6.) First, the need for memory in Hatanaka does not indicate that any steps would be kept in a single area of memory – a step repository. Rather, the steps of Hatanaka, to the extent there are any, could be stored at multiple locations, not in a step repository. More important, nothing in any of the prior art references provides any sort of motivation to change Hatanaka so as to achieve the invention in pending claim 6. Also, Hatanaka discloses that relationship data can be stored in an element's data structure. But as indicated above, this relationship data is not steps. Furthermore, the element's data *structure* in Hatanaka is not a *step* repository. The step repository comprises areas where steps—the features that are executed to implement changes to a model—are stored. See Application, page 8, lines 18-20. Thus, Hatanaka does not disclose or suggest the storing of steps in a step repository.

As another example, claims 7 and 8 recite that one of the steps is a nul step, and claim 8 recites that the nul step instigates regeneration. The Office Action admits that Hatanaka does not disclose this feature, but asserts (without any documentary evidence) that use of a “nul” step to idle regeneration is well known. But the Office Action cites absolutely no evidence for that wholly conclusory proposition. In addition, even if one assumed that a prior art reference somewhere showed use of a nul step with regeneration, the Office Action shows absolutely no suggestion in Hatanaka or anywhere else to use such a feature. Moreover, there could be many other ways to idle regeneration other than a nul step, and the Office Action does not show why a nul step would be used to idle regeneration, when such a nul step could be used for many other functions, as described in the pending patent application.

Finally, the grafting of a nul step onto Hatanaka in the Office Action appears to be motivated solely by the teaching of the pending application, and not by any motivation in the prior art to provide the feature. As a result, the Office Action involves an improper hindsight

analysis. *See, e.g., In re Kotzab*, 217 F.3d 1365, 55 USPQ2d 1313 (Fed. Cir. 2000) (faulting the Examiner and Board for falling into the "hindsight trap."); *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999). For each of these reasons, claim 7 and 8 are also in condition for allowance.

Claim 15, the independent system claim, recites a system for regenerating a design model comprising a model element, a step propagator that receives a first step that represents changes in the model element and produces a second step that represents other changes in the model element that are dependent on the first step, and a step executor that executes the first step and the second step. As noted above, Hatanaka appears merely to place F nodes in a queue, and to perform generation functions on each node sequentially until the queue is empty. Thus, Hatanaka does not disclose or even suggest the creation of two separate steps that can be executed to regenerate a design model, where the second step represents changes that are dependent on the first step. The Office Action again recognizes the shortcomings of Hatanaka, and provides no evidence to support a conclusion of obviousness. As a result, and for the additional reasons discussed above, the applicants respectfully suggest that claim 15 is in condition for immediate allowance, and request the same.

Dependent claim 28 further recites that the first plurality of steps depends on the execution of the first step. It is difficult to determine from the Office Action where the office has located this feature in the prior art, if at all. However, the step is in neither Ardoin nor Hatanaka. In particular, neither application ties later steps to the execution of a first step.

Independent claims 30 and 32 contain similar limitations to those in the other independent claims, and are patentable for the reasons discussed for the other claims. Independent claim 30 recites a method for updating data in a computer model, comprising analyzing an element to determine if it has been touched by a change, associating the element with one or more steps that effect the change, creating one or more additional steps that propagate changes based on relationships between the element and other elements, sorting the one or more steps and the additional steps to eliminate interference among the steps, and executing the sorted steps. Again, no reference discloses or suggests the use of multiple steps as

recited in the claim. Also, as noted in the preceding paragraph, Ardoin does not disclose or suggest the sorting of steps to eliminate interference among steps.

Independent claim 32 recites a method for propagating a change, comprising identifying an atom associated with a changed element, generating a first step to carry out the change, retrieving relationship information that defines predetermined relationships among elements, generating propagated steps that depend on the change and the relationship information, sorting the steps, and executing the steps to properly reflect the changes to the element and the related elements. Again, as described above, neither of the cited references disclose or suggest the generation of propagated steps that depend on a first step, and neither reference discloses or suggests the sorting of such steps. As a result, claim 32 is also in condition for allowance.

Rejections under 35 U.S.C. § 103 over Hatanaka in view of Pabon

The Examiner rejected claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka (U.S. Patent No. 5,923,573) in view of Pabon (U.S. Patent No. 5,251,290). Claim 29 depends on independent claim 18, and adds the feature of "verifying the elements after execution for constraint satisfaction." As an initial matter, Pabon does not disclose or suggest any of the matter that is missing from Hatanaka as discussed above for claim 18 (including the step of sorting the steps), so claim 29 is patentable for this reason. At most, Pabon impose restraints before execution, not after. Thus, Pabon does not disclose or suggest the verification of elements after execution for constraint satisfaction, as recited in claim 29. And again, the Office Action has not presented any motivation (outside of the applicants' disclosure) to combine the prior art as the examiner has done here. For these reasons, the applicants submit that claim 29 is in condition for immediate allowance, and request the same.

Rejections under 35 U.S.C. § 103 over Hatanaka in view of Hollingsworth

The Examiner rejected claim 31 under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka (U.S. Patent No. 5,923,573) in view of Hollingsworth et al. (U.S. Patent No. 5,444,836). Claim 31 is an independent claim.

Claim 31 recites a method of propagating changes made in one data element to a related data element, comprising accumulating changes made to the one data element, identifying a predetermined number of possible mutually-exclusive sets of changes that may be made to a related data element, selecting the most appropriate set of changes by employing a predetermined selection standard, and testing the selected set of changes to determine whether it is an appropriate set of changes. The examiner appears to rely on Hollingsworth (and perhaps on unstated knowledge of the skilled artisan) as disclosing the steps of identifying sets of changes, and selecting the most appropriate set of changes. However, as noted above, Hollingsworth simply discloses a system that uses certain rules for the placement of objects. If a particular rule causes "overplotting," the rule fails. (*See* Hollingsworth, Col. 10, lines 24-30.) This disclosure by Hollingsworth does not, as the Office Action maintains, indicate that any sort of selection of one set of changes is being made from among a group of possible changes. Rather, it merely shows the failure of a rule. Nor does Hollingsworth make any other such suggestion to the applicants' knowledge. Therefore, the applicants suggest that claim 31, like the other claims, is in condition for immediate allowance.

Applicant : Irwin Jungreis and Michael Lauer  
Serial No. : 09/713,492  
Filed : November 15, 2000  
Page : 21 of 21

Attorney's Docket No.: 12116-003001

**CONCLUSION**

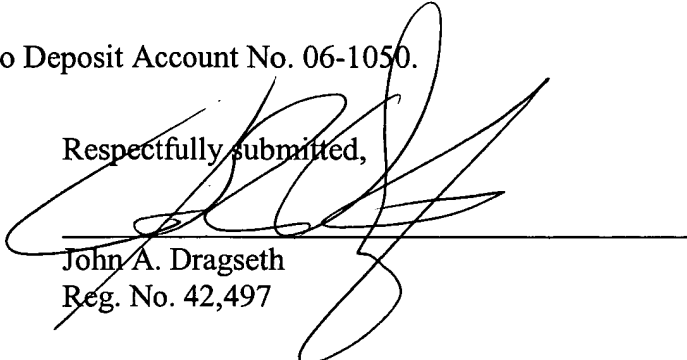
In reply to the action mailed August 14, 2003, the Applicant asks that all the claims be allowed in view of the amendments to the claims and remarks contained on the previous sheets, a total of 21 pages. Also enclosed is a Request for a One-Month Extension of Time, together with the necessary fees (\$110).

Please apply any charges or credits to Deposit Account No. 06-1050.

Date: \_\_\_\_\_

12-15-03

Respectfully submitted,

  
\_\_\_\_\_  
John A. Dragseth  
Reg. No. 42,497

Fish & Richardson P.C., P.A.  
60 South Sixth Street, Suite 3300  
Minneapolis, MN 55402  
Telephone: (612) 335-5070  
Facsimile: (612) 288-9696